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Tripotents in algebras: Invertibility and hyponormality

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Abstract

© 2014, Pleiades Publishing, Ltd. Let A be a unital algebra over complex field ℂ, I be the unit of A. An element A ∈ A is called tripotent if A3 = A. Let Atri = {A ∈ A: A3 = A}. We show that A ∈ Atri if and only if I ± A − A2 ∈ Atri. We study invertibility properties of elements I + λA with A ∈ Atri and λ ∈ ℂ \ {−1,1}. Let X be a Banach space with the approximation property and A, B ∈ B(X)tri. If A − B is a nuclear operator then tr(A − B) ∈ ℂ. We show that if H is a Hilbert space and an operator A ∈ B(H)tri is hyponormal or cohyponormal then A = A*. We also prove that every A ∈ B(H)tri similar to a Hermitian tripotent.

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Keywords

algebra, Banach space, Hilbert space, hyponormal operator, idempotent, invertibility, nuclear operator, projection, similarity, symmetry, trace, tripotent